Ultrasound for neuromodulation and control of post-trauma pain

Award Information
Agency:
Department of Defense

Branch
Army
Amount:
$994,893.00

Award Year:
2012
Program:
SBIR

Phase:
Phase II
Contract:
W911NF-12-C-0045

Agency Tracking Number:
A2-4971
Solicitation Year:
2011

Solicitation Topic Code:
A11-020
Solicitation Number:
2011.1
Small Business Information
Neurotrek, Inc
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Hubzone Owned:
N

Socially and Economically Disadvantaged:
N
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N

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Abstract
The objective of this proposal is to design devices using ultrasound induced neuromodulation to manage pain. Neurotrek, Inc (formerly SynSonix, LLC) has been developing ultrasound neuromodulation (UNMOD) to noninvasively stimulate neural circuitry. Many studies have established the beneficial effects of neurostimulation for managing pain. However current methodologies require surgical implantation of stimulating electrodes which is an impractical solution for acute traumas. Pain management for acute traumas is generally accomplished with narcotics, which is less than ideal in a battlefield scenario as they severely effect cognitive abilities and have other unwanted side effects such as respiratory depression. Our technology of peripheral ultrasound neuromodulation (PUNMOD) offers several advantages over narcotics and current methods of neurostimulation. PUNMOD has the potential to be highly portable as a battlefield analgesic and has the advantage of leaving the patients cognitive abilities intact. In addition PUNMOD does not carry with it the risk of abuse or the need for the surveillance that is associated with pharmaceutical analgesics. In the current proposal we plan to build on our Phase I achievements by: 1) performing essential safety studies in a large animal model, 2) demonstrating a proof of concept for PUNMOD in humans and characterizing the waveforms that modulate distinct pain modalities,3) developing strategies to focus UNMOD through bone with high spatial resolution, 4) characterizing a different type of US transducer that would confer several advantages, 5) developing an advanced prototype for the management of post-traumatic pain.

* information listed above is at the time of submission.